



Emerging Business Models to Drive Energy Efficiency



Department of Commerce
Innovation is in our nature.

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INTRODUCTION

The past three decades have seen increasing efforts to drive energy efficiency into the built environment in the state of Washington. Since the first Power Plan was issued in 1982 by the Northwest Power and Conservation Council, improvements in efficiency have met 40 percent of the new demand for electricity in the region. Most recently, the 2009 American Recovery and Reinvestment Act (ARRA) funded a wide range of energy efficiency programs, including job training for energy retrofits, subsidies for energy efficiency improvements, and financial support for new technologies. Most of these ARRA-funded projects will wrap up in 2012, which will end many of the jobs and service delivery models that relied on those funds. Fortunately, the Recovery Act may prove catalytic for companies that developed enduring business models for delivering energy efficiency that will persist long after the federal money is gone.

A large body of research points to significant opportunities for cost-effective energy efficiency savings in the existing building stock. A growing population, rising energy costs, and environmental imperatives combine to create a need to extract these savings to meet the resource demands of Washington's citizens. Research and the region's experience have demonstrated that the lowest cost, least polluting unit of energy is the one that is not used. In other words, it is more cost-effective and less environmentally harmful to deploy conservation than to build new power generating facilities. Further, investments in building energy efficiency also result in natural gas, oil, propane, and other non-electric savings. Accessing those efficiency savings requires skilled workers, effective marketing, and a policy environment that supports and encourages improvements in the built environment.

This report attempts to answer the question: *What are the business models and aligned policy that will support the ongoing drive toward energy efficiency and employment in the built environment, particularly after the recent wave of federal funding?*

The Recovery Act may prove catalytic for companies that developed enduring business models for delivering energy efficiency.

To address this question, we examine seven companies and programs that deliver different aspects of energy efficiency to various types of customers. The Department of Commerce's mission is to grow and improve jobs, so these models are primarily assessed as potential sources of employment as the economy recovers. Ideally, all of those trained under ARRA and other green workforce programs would be successfully connected to viable sources of employment. This report looks both at companies that appear to have a path forward without subsidies, and those that have been sustained by the influx of ARRA dollars and are now thinking about how to continue their activities without federal dollars.

While primarily focused on the residential sector, we also examine two companies that address the commercial demand for energy-efficient buildings. The industrial sector accounts for a significant source of potential energy efficiency savings, but is outside of the scope of the present research.

Energy efficiency work in the built environment spans a continuum of possible interventions. At one end falls new construction and the full retrofitting of existing buildings to high standards. At the other end are smaller improvements, such as building shell upgrades, appliance replacements, and HVAC improvements. The placement on the efficiency continuum is influenced by which individual or body decides to make the changes, pays for the services, and assumes the risk of the investment – which is not always the same entity. The companies and programs we profile in this report have successfully identified their customers and targeted their interventions to the needs of each client base.

To support these emerging business models, this report also discusses in brief some policy suggestions that can aid companies like these and create an environment that supports innovation in the energy efficiency field. These policy proposals are timely, as later this year the Department of Commerce will release an update to the State Energy Strategy. Learning the experiences of these companies can help inform a strategy that meets the state's goals for energy and the economy.



CONTEXT AND BACKGROUND

As the population of Washington grows and the need for energy increases, greater efficiency is crucial to meeting demand. According to the Sixth Northwest Power Plan, cost-effective efficiency improvements have the potential to provide, on average, 85 percent of the new demand for electricity over the next 20 years.¹ Approximately two-thirds of that total comprises efficiency measures in the built environment (commercial and residential sectors).² In contrast to the development of new energy generation, efficiency measures are the quickest and least expensive path to meet the demand for electricity.

Washington has a multifaceted approach to making buildings more efficient. The strategies used by the companies profiled in this report mirror solutions proposed by McKinsey and other national thought leaders:

- 1) Improve information and education about cost-effective energy saving measures,
- 2) Offer incentives and financing to overcome the hurdle of upfront investment,
- 3) Implement codes and standards for renovation and new construction, and
- 4) Include third-party involvement to purchase and install improvements for the end-user.³

Efficiency measures are the quickest and least expensive path to meet the demand for energy.

The solutions for energy efficiency are implemented by private firms with the capacity to install, construct, and renovate for energy efficiency, while government and utility investment subsidizes and encourages the fledgling efficiency market.

ARRA and Energy Efficiency

The introduction of federal funding through ARRA gave a boost to the energy efficiency efforts in Washington by funding workforce training and sponsoring efficiency projects.

ARRA for Energy Efficiency Job Training

A total of \$27 million was invested to train 8,935 Washingtonians to work in “green jobs.”⁴ A green job is one in which the employee is predominantly engaged in at least one of the following economic areas:

¹ Northwest Power and Conservation Council, “Sixth Northwest Conservation and Electric Power Plan,” Northwest Power and Conservation Council (February 2010), 3.

² Ibid., 4-2.

³ Hannah Choi Granade, Jon Creyts, Anton Derkach, Philip Farese, Scott Nyquist, Ken Ostrowski, “Unlocking Energy Efficiency in the U.S. Economy,” McKinsey Global Energy and Materials, McKinsey and Company (July 2009), x.

⁴ Washington State Department of Commerce, *Federal Recovery Grants Awarded to Washington State for Green Economy*, (30 August 2010), <http://www.energy.wsu.edu/Documents/WAStateGreenEconomy.pdf>. Programs propose to serve 8,935 through job-training or capacity-building and to assist 6,344 in job placement.

1) increasing energy efficiency, 2) producing renewable energy, 3) preventing and reducing environmental pollution, and 4) providing mitigation or cleanup of environmental pollution.⁵

Under ARRA, 10 grants were awarded through the U.S Departments of Labor and Energy, the majority of which were distributed in the first quarter of 2010. While many of the funded programs address the green economy generally, two of the largest grant recipients specifically target the development of energy efficiency occupations:

- The Workforce Education and Training Board received \$5.9 million to serve an estimated 5,174 workers in “targeted populations in high demand, professional-technical occupations needed for energy efficiency in commercial and public building.”⁶ Those served under the grant included construction workers looking to update their skills in energy-efficient construction, at-risk youth, low-income adults, people with disabilities, and veterans. Participants in the construction trade could receive certification in green skills, energy management, energy auditing, and photovoltaic installation and design.
- The Northwest Energy Efficiency Council received \$3.87 million for its Sound Energy Efficiency Development (SEED) project to train and certify an estimated 675 workers for residential energy auditing, building operation, and Occupational Safety and Health Administration (OSHA) safety. The targeted populations include older youth, dislocated workers, incumbent workers, veterans, women, and individuals with disabilities.

ARRA for Energy Efficiency Projects

In addition to investment in job training, the Recovery Act provided funding for energy efficiency projects to local jurisdictions and tribes, the Washington State Department of Commerce, and the Washington State University (WSU) Extension Energy Program.

- The Department of Commerce was awarded and administered \$10.6 million in ARRA Energy Efficiency and Conservation Block Grant (EECBG) program funding.⁷ The majority of funds was passed through to the state’s smaller cities and counties, and supported a variety of efficiency projects, including energy audits and retrofits, energy-efficient traffic signals and street lighting, and financial incentive programs.
- Through the WSU Extension Energy Program, \$14.5 million in ARRA State Energy Program grants were distributed to eight projects across the state to increase energy efficiency in residential and small commercial buildings, as part of the Community Energy Efficiency Pilot Program.⁸

⁵ Washington State Department of Commerce and Workforce Training and Education Coordination Board, *Evergreen Jobs Initiative: ARRA Funds in Washington: Report on Performances and Outcomes (RCW 43.330.375)*, (Olympia, July 2010), http://www.commerce.wa.gov/Downloads/DO/ReportsToLegislature/Evergreen_Jobs_Initiative_Report_July_2010.pdf.

⁶ Department of Commerce, *Evergreen Jobs Initiative*.

⁷ Department of Commerce, *Federal Recovery Grants*.

⁸ Washington State Department of Commerce, *ARRA State Energy Program (SEP) Awards*, (Olympia, June 2011), <http://www.energy.wsu.edu/Documents/SEP%20Awards.pdf>.

- ARRA funding specifically for weatherization-related activities in Washington amounted to \$66.5 million,⁹ which weatherized over 10,000 homes.¹⁰ Weatherization Assistance Programs generally target lower-income homes where the potential for energy savings tends to be high, and the savings captured in a monthly energy bill have greater relative significance. Nineteen percent of potential energy savings in the residential sector lies in existing low-income homes in the U.S. (Figure 2).
- The Department of Commerce administered \$6.2 million in ARRA funds for the State Energy Efficient Appliance Rebate Program, distributing over \$5.5 million in rebates to Washington residential customers who purchased eligible high-efficiency appliances between March and November 2010.¹¹
- As part of the Energy Efficiency Credit Enhancement Program, Commerce administered \$5 million in ARRA State Energy Program grants to six entities for energy efficiency retrofits in residential and commercial buildings.¹² Funds were used to establish financing mechanisms, including loan-loss reserves and interest rate buy-downs, to increase the availability of private lending.

Utility Investment in Energy Efficiency

As evidenced by the Sixth Northwest Conservation and Electric Power Plan, electric utilities view energy efficiency as an investment that helps them avoid huge infrastructure costs for new power generation. Washington utilities budgeted \$146 million for energy efficiency programs in 2009, according to the Consortium for Energy Efficiency.¹³ Utilities have also made these investments to comply with state ballot Initiative 937, which requires qualifying utilities to undertake cost-effective energy conservation.

The Sixth Northwest Power Plan states that the regional population is likely to increase from 12.7 million in 2007 to 16.7 million by 2030, an increase of 31 percent. The population increase, paired with an expected increase in demand for air conditioning and consumer electronics, points to a clear need for more efficient use of current energy resources.

Utility investments take the form of:

- Weatherization programs: Community Action Agencies in Washington, like the Opportunity Council profiled in this report, implement weatherization programs with funding from government entities, utilities, local governments and private donations. Utilities also partner

⁹ U.S. Department of Energy, *Energy.gov/List of Awardees*, accessed on 8 June 2011, <http://www.energy.wsu.edu/Documents/WAenergyARRAfunding.xls>.

¹⁰ Washington State Department of Commerce, *Washington State Weatherization for American Recovery and Reinvestment Act: Update through June 1, 2011*, (Olympia, June 2011), <http://www.energy.wsu.edu/Documents/Wx%20Report%20060111.pdf>. As of 1 June 2011, the Weatherization Assistance program weatherized 10,404 homes, more than 3,000 homes ahead of the target of 7,170.

¹¹ Washington State Department of Commerce, *State Energy Efficient Appliance Rebate Program*, (Olympia, June 2011), <http://www.energy.wsu.edu/Documents/SEEARP%20Award.pdf>.

¹² Department of Commerce, *ARRA SEP Awards*.

¹³ American Council for an Energy-Efficient Economy, *State Energy Efficiency Policy Database: Washington*, accessed on 10 June 2011, <http://www.aceee.org/sector/state-policy/washington>.

with private companies, such as UCONS, profiled in this report, which installs energy efficiency improvements in manufactured homes through a grant from Puget Sound Energy and in partnership with the WSU Extension Energy Program.

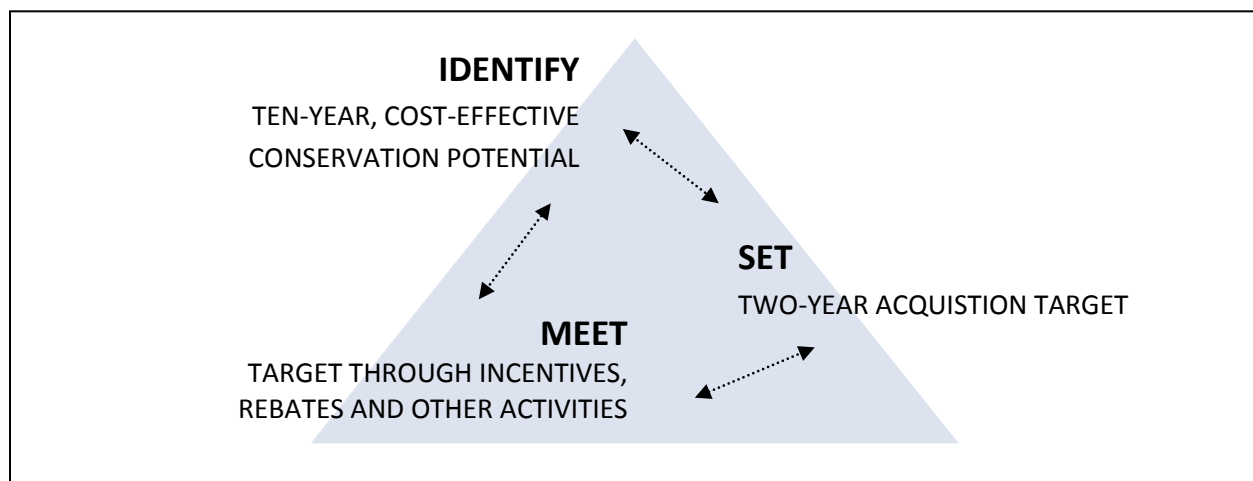
- Rebates for energy-efficient appliances: One example is the consumer rebates for ductless heat pumps featured in the case study of MetFab Heating.
- Rebates for lighting, insulation, air sealing, and other improvements to existing buildings.

Initiative 937: Energy Independence Act

“Each qualifying utility shall pursue all available conservation that is cost-effective, reliable, and feasible.” – RCW 19.285.04

The Energy Independence Act (I-937), approved by Washington voters in 2006, requires the state’s major electric utilities to gradually increase the amount of renewable resources in their electricity supply and to identify and implement all cost-effective, reliable and feasible electricity conservation measures. Beginning in 2010, and every two years thereafter, major utilities must identify the total electricity conservation potential that could be achieved cost-effectively over the next 10 years, establish a target for acquiring at least one-fifth of that total within the next two years, and meet that target during the subsequent two-year period (Figure 1).

Figure 1: Utility requirements under I-937



A 2010 report from the Washington State Energy Office found that utilities that must comply with I-937 are planning more active conservation activities than other utilities. Utility investments in efficiency are

estimated to increase to at least \$170 million per year to meet the first conservation acquisition targets in 2012, and rise further in future years.¹⁴

A significant portion of these expenditures will likely be directed to conserving electricity in the built environment. The Northwest Power and Conservation Council estimates that up to 5,900 average annual megawatts¹⁵ (annual MWa) of efficiency can be cost-effectively developed in the region over the next 20 years. Of that total, 44 percent, or 2,600 annual MWa, in conservation potential is in the residential buildings and appliances sector (principally from improvements in water-heating and HVAC efficiency). In addition, 24 percent, or 1,400 annual MWa, is available in the commercial sector (about two-thirds of which are in lighting savings).

Codes and Standards

Washington utilizes the building code to address efficiency by requiring new buildings to meet specifications for energy use. The 2009 Senate Bill 5854, now codified in RCW 19.27A.060, directs the Washington State Building Code Council to develop energy codes that achieve a 70-percent reduction in building energy use by 2030, as compared to the baseline established by the 2006 Washington State Energy Code.¹⁶

Commercial Building Energy Use Disclosure

RCW 19.27A.170 directs owners of commercial buildings to disclose the building's energy usage for the most recent continuously occupied 12-month period to a prospective buyer, lessee, or lender. The requirement currently applies to buildings greater than 50,000 square feet, and will be extended to buildings greater than 10,000 square feet by January 2012.

A subsequent part of the statute addresses buildings owned by state government. State-owned buildings are assessed an Energy Star Portfolio Manager Score, and those that score poorly are required to proceed with energy audits and improvements if they are determined to be cost effective.

The Potential in the Built Environment

The U.S. residential sector accounts for approximately 20 percent of greenhouse gas emissions and roughly 20 percent of the country's total energy consumption. Because buildings that are in use today will compose over half of the building stock in 2050, meeting energy use targets will necessitate a series

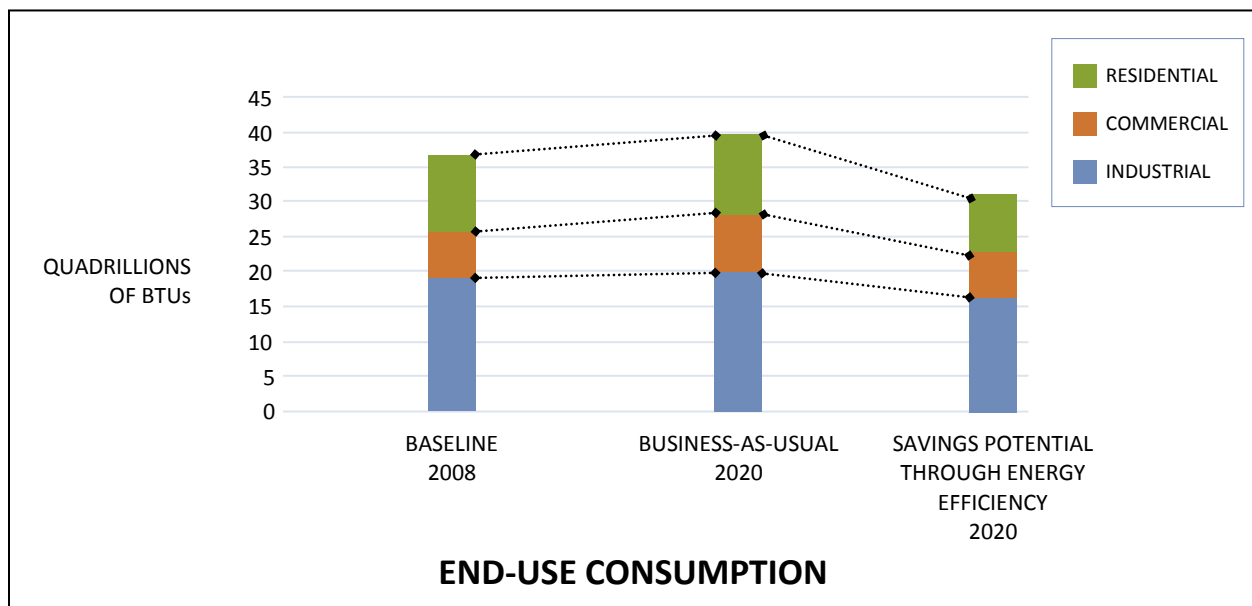
¹⁴ For the sake of comparison, the Recovery Act provided about \$40 million for energy efficiency activities (excluding the Weatherization Assistance Program) in Washington over three years from 2009 to 2012.

¹⁵ One average annual megawatt is 8,760 megawatt-hours (8.76 million kilowatt-hours) of electrical energy.

¹⁶ 2011 Strategic Plan for Enhancing Energy Efficiency and Reducing Greenhouse Gas Emissions from Homes, Buildings, Districts and Neighborhoods

of improvements to existing buildings.¹⁷ Business-as-usual (BAU) projections predict that end-use energy consumption will reach 39.9 quadrillion British thermal units (BTUs) in 2020, or an 8-percent increase over current usage. However, the global management consulting firm McKinsey and Company estimates that a large-scale investment in energy efficiency would result in a 23 percent *decrease* over BAU projections. Of these savings, the residential sector accounts for 35 percent of the end-use efficiency potential, the commercial 25 percent, and the industrial sector 40 percent of the potential (Figure 2).¹⁸

Figure 2: Annual energy savings potential across sectors



Source: McKinsey and Company

McKinsey estimates that if energy efficiency improvements were executed to scale in each of the three sectors, gross energy savings would total more than \$1.2 trillion. But the challenges to accessing these savings are notable. The building stock is diverse and spread across millions of locations. Billions of appliances and devices used in residential, commercial, and industrial settings contain the potential for additional savings. The disaggregated nature of the built environment makes transaction costs a significant proportion of any single job, and it also ensures that the resulting savings for any one customer are often not significant, particularly when spread over a multi-year payback period. According to McKinsey, “This dispersion assures that efficiency is the highest priority for virtually no one.” Lastly, it

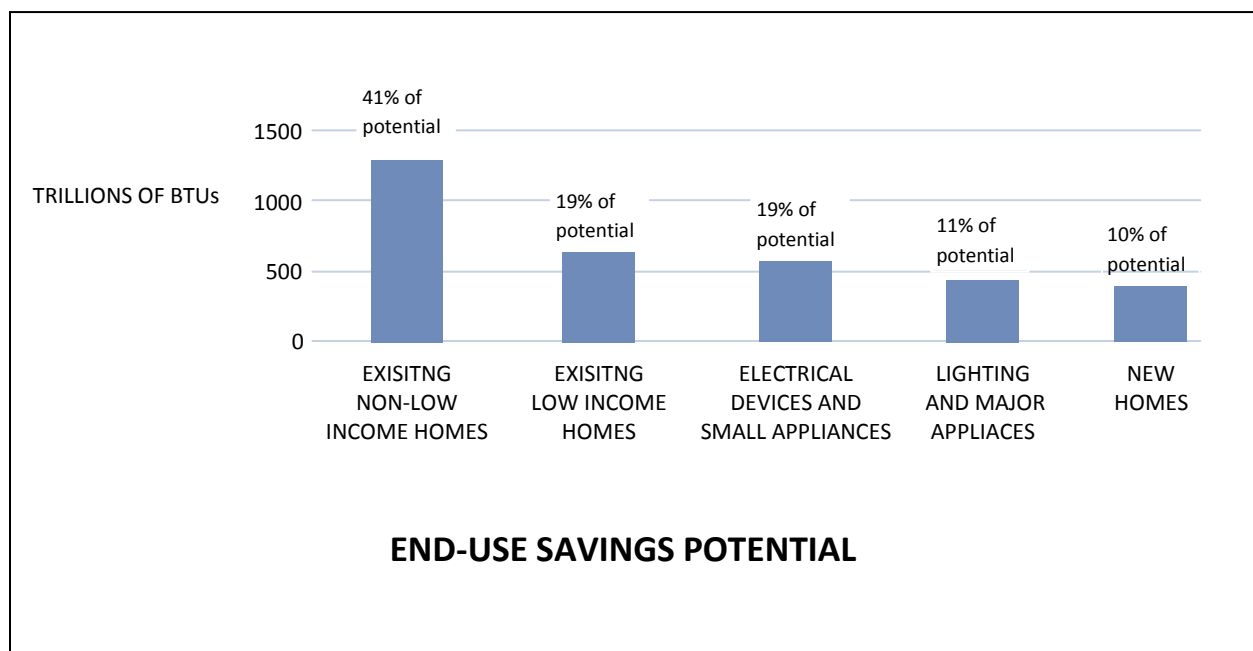
¹⁷ Merrian C. Fuller, Cathy Kunkel, Mark Zimring, Ian Hoffman, Katie Lindgren Soroye, Charles Goldman, “Driving Demand for Home Energy Improvements: Motivating residential customers to invest in comprehensive upgrades that eliminate energy waste, avoid high bills, and spur the economy,” Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory (September 2010).

¹⁸ Granade et al., “Unlocking Energy Efficiency.”

is difficult to measure and verify energy *not* consumed as a result of efficiency measures, making the consumer case more dependent on good faith than hard science.

Figure 3 illustrates the savings potential across aspects of the residential sector. The non-low-income sector holds the lion's share of the potential savings, but also requires the steepest upfront investment to access it. According to McKinsey, given adequate investment to access savings, the non-low-income sector would realize a 9 increase on present value, whereas the low-income sector would see a 74 percent increase in present value savings. Nearly one-quarter of the return for the low-income sector would be in the multifamily environment, and slightly less than one-tenth would occur in manufactured housing. The higher ROI associated with the low-income residential sector can largely be attributed to the fact that 92 percent of the savings opportunity is in shell upgrades – relatively low-cost improvements that result in a tighter envelope for the home.

Figure 3: Annual energy efficiency savings potentials across residential sectors



Given the potential that exists to save up to \$130 billion annually, increase the comfort for those dwelling in these homes, and conserve energy, the key question becomes how to reach and motivate consumers and building owners.

Consumer Demand

Consumers are demonstrating increased awareness and concern about the limits of energy availability and the effects of greenhouse gases on the climate. The slow recovery from the recession further ensures that homeowners and tenants are looking for ways to save money. A growing body of research examines how to provide consumers with the information they need to make the decision to invest in energy efficiency.

A 2010 report from the Lawrence Berkeley National Laboratory answers the question with a number of recommendations for program designers. For businesses offering energy efficiency services, the key message, and one that is likely the most intuitive, is to *sell something people want*. Messages about improved quality of life resulting from energy upgrades reach more customers than simply providing information and financing opportunities. “High energy usage is not a problem that most people are actively looking to solve. Instead, identify a problem the customer actually has.”¹⁹ Messages about home comfort, cost, and energy savings, health, and community pride may be effective in engaging potential customers.²⁰ This is especially true in Washington, where relatively low electricity costs are the norm, and, for the populous western side of the state, where a mild climate leads to modest demand for space heating and cooling energy compared to other parts of the country.

The diversity of homeowners in the residential sector – across income levels, age, and interest in conservation, to name just a few – ensures that there are many reasons that consumers either do or do not choose to invest in energy efficiency. Among those who do elect to upgrade, the primary reasons are as follows:

- “I buy it because I want it” – reasons of comfort, health, social norms, or values contributed to the decision to buy.
- “Energy savings will cover the costs of my investment over the long term” – the consumer can afford to invest in measures that will pay off eventually in lower energy bill costs.
- “Someone – a government program or utility – will give me incentives to make investments” – reducing the upfront costs and making the purchase more feasible.
- “I buy a home with high energy efficiency because it is one of an array of attributes that signals quality” – in a buyers’ market, green retrofits attract interest, and increased visibility leads to more sales.

¹⁹ Fuller et al., “Driving Demand.”

²⁰ Ibid.



CASE STUDIES

Seven companies profiled in this section follow four different models to deliver energy efficient improvements to residential and commercial customers:

The Information Model

One company delivers information and increased consumer awareness as its business product.

EnergySavvy, founded in 2008, is a software and internet services company targeting the knowledge gap between consumers and contractors of energy-efficient services and equipment. Since 2010 the business has supplied utility companies and state agencies with customized audit software, including the states of Oregon and Utah, and Seattle's Community Power Works.

The Non-Owner Occupied Improvements Model

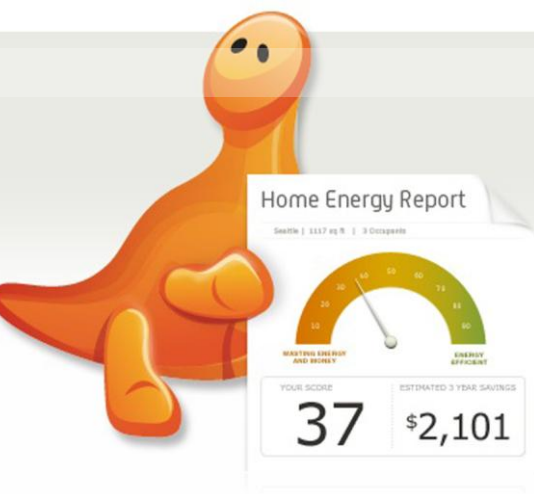
Green Canopy Homes implements energy efficiency improvements at the time of vacancy for a home. The company purchases distressed residential properties and remodels the homes to make them more efficient. Rather than charging more for a "green" home, Green Canopy believes that the energy-efficient home priced at market will sell faster than otherwise equal properties. By instituting the improvements prior to sale, Green Canopy takes advantage of a window of opportunity in which the consumer decision-making process is removed from the equation.

The Owner-Initiated Improvements Model

Three companies follow a more traditional business model in which they respond directly to the needs of their customers – business- and homeowners. **Rushing Company** is an engineering and consulting firm specializing in sustainable design practices and LEED certification for new construction, as well as retro-commissioning for existing buildings. The majority of its customers are commercial. **McKinstry** is a full-service design, build, operate, and maintain firm offering construction, energy, and facility services to clients around the country. The firm's Total Cost of Ownership model includes energy audits and energy modeling to convey potential energy savings to clients. **MetFab Heating, Inc.**, is a home heating company in Clark County that specializes in the installation of ductless heat pumps. Since 2008 requests for heat pumps have increased significantly due to a rebate through Northwest Ductless Heat Pump Project and Bonneville Power Administration.

The Third-Party Payment Model

Two firms have leveraged funding available under the Recovery Act to deliver home weatherization services to low- and mid-income homeowners. **The Opportunity Council** is a nonprofit organization funded through state grants, utility companies, and local sources. Its weatherization program serves low-income households and provides clients with before and after energy audits to document the efficiency provided by the upgrades. **UCONS** targets efficiency in manufactured homes, by offering residents free duct sealing, water pipe wraps, air filter replacement, compact florescent light bulbs, and high-performance showerheads and faucet aerators. UCONS, contracting with Puget Sound Energy, services an average of 500 homes a month in the 12-county region served by the utility.



Information Model

EnergySavvy

Software and internet services company with a mission to make energy efficiency easier and more accessible for homeowners.

1517 12th Avenue #302
Seattle, WA 98122

Number of Employees: 33 Year Founded: 2008

Region Served: National www.energysavvy.co

Profile

EnergySavvy, founded in 2008, targets the knowledge gap between consumers who want to increase their home's energy efficiency and contractors who can provide targeted services and appliances. According to Scott Case, the company's Vice President of Product Management, "Making your home energy efficient makes a ton of sense, but, on the consumer side, there is a lack of good and simple information. Many experts only talk about efficiency in terms of building science, with a high level of complexity, and that isn't helpful for homeowners."

Business Model

The website portal, launched in early 2009, encourages visitors to take an online audit to gather information about their home's age, condition, energy usage, and appliances. The consumer receives an overall score for their house or apartment and suggestions on how to improve its energy usage. The homeowner is then invited to receive bids from contractors licensed to do installations and retrofits.

"The result is an engaged and motivated homeowner and, sometimes, a business lead for the contractor," said Scott. As a result of the EnergySavvy online audit, homeowners who might have been merely considering new windows now start to think of the house as a system, and are more likely to make comprehensive upgrades.

During its first year and a half, EnergySavvy's revenue came from fees charged to contractors in exchange for business referrals

generated by the web portal. Over 500 contractors received referrals, and paid between \$10 and \$60 per job lead, based on the likely value of the job lead. Interestingly, in the project's first year between 20 and 30 percent of the leads were not filled, due to the challenges of finding contractors qualified to do energy-specific audits and retrofits. The unmet need was greatest in sparsely populated areas; Seattle and other large cities experienced no shortage of skilled workers.

EnergySavvy's founders always envisioned offering the service nationally, in part driven by the increased opportunities for savings in regions with colder climates and more expensive electricity rates. While many of the enrolled contractors are still based in Washington, their network of contractors now extends nationwide.

In 2010, the funding model expanded to supply utility



“Many experts only talk about efficiency in terms of building science, with a high level of complexity, and that isn’t helpful for homeowners.”

—Aaron Fairchild

companies and state agencies with customized audit software. Scott explained, “We started to pivot the business to using the same tools, services and online marketing techniques to help make utility and government programs more effective.” Customized versions of the online audit program are now being used by the states of Oregon and Utah, and by Seattle’s Community Power Works, among others.

The company plans to double in size over the next year, based on demand for its offerings for utilities and government-run efficiency programs.

After ARRA

Several of the utility programs that acquired EnergySavvy’s software are funded by ARRA. From the company’s viewpoint, the key benefit of ARRA was to create a deadline by which programs had to be operational and funding had to be spent, and thus create a sense of urgency within the industry.

Case predicted that the efficiency programs under ARRA which were proven to work cost-effectively will be sustained by the marketplace and integrated into ongoing programs run by utilities. He sees a future in a combined auditor/contractor model, in which the costs of the audit are subsidized by additional work on the home, but doubts that the stand-alone audit model will sustain.

Without the Recovery Act deadline, Case estimated it will be challenging to drive activity and innovation within state governments and utility agencies. “In the internet world, we’re used to change happening fast, but in the energy industry we’ve come to terms with a much more deliberate pace,” reported Case. “The ARRA spending deadline, as much as the money, has accelerated the pace of innovation in the energy efficiency space. Hopefully there will be ways to keep that pace of change quick in the post-ARRA world.”

Policy Intersections

Case argued that new and existing energy efficiency programs should be focused on the goal of driving energy retrofit activity, not simply getting audits done. Policy makers should be asking questions about how many upgrades and how much energy will be saved as a result of every home efficiency program, not just how many audits were performed.



Non-Owner Occupied Improvements Model

Green Canopy Homes

Renovates and resells Seattle-area homes with a focus on energy efficiency improvements.

999 North Northlake Way #203
Seattle, WA 98103

Number of Employees: 6

Year Founded: 2009

Region Served: Seattle

www.greencanopyhomes.com

Profile

Green Canopy buys and remodels physically distressed residential properties with a focus on energy-efficiency retrofits. The company also provides consulting and policy advocacy. Its founders and employees are largely from the real estate field.

Cofounder Aaron Fairchild wants to change the perception that “green costs more.” Rather than charge a green premium, he said green value is the most cost-effective way to distinguish his product in a crowded market. Green Canopy’s goal is to sell its homes first, rather than for higher prices.

Business Model

Green Canopy purchases homes in need of repairs and which may be undervalued due to being bank or estate sales. Fairchild explained that the company is “very aggressive” in its purchasing negotiations, closely adhering to the real estate maxim, “You make your money on the buy.”

After purchase, Green Canopy contracts with the Seattle-based company Ecofab to conduct an energy audit and register a baseline score. The company serves as the general contractor on each project, hiring subcontractors as needed. The upgrade focuses on repairs, curb appeal, and new appliances, with under 3 percent of the budget going to energy-efficiency retrofits.

“We don’t have a one-size-fits-all retrofit but do what makes sense for that home given its location within the market and sub-market,” said Fairchild. The

company then does a second audit to compare pre- and post-retrofit scores. To date, Green Canopy homes are achieving average savings equivalent to over 12,000 pounds of greenhouse gas emissions per year, or roughly the annual emissions of a car, due to the energy upgrades.

While the company uses traditional marketing, it also employs social media approaches and other “compelling ways to create interest around the home.” Before construction, Green Canopy erects a sign in front of the house, highlighting the green remodel and inviting neighbors to vote on the house color.

One aspect the marketing doesn’t emphasize, however, is anticipated utility savings. “The savings are there, but the amount is around \$100 a month, so it’s not worth emphasizing as a primary value proposition. We share and market the savings, to



“We don’t have a one-size-fits-all retrofit, but do what makes sense for that home.”

—Aaron Fairchild

be sure, but it is not what we lead with,” said Fairchild.

Company leaders dislike the idea of a “green premium.” In a tight market, consumers are not willing to pay more for energy-efficient homes on a consistent basis. Therefore, Green Canopy aims to distinguish its product, grab buyers’ attention, and sell its homes first. “All else being equal, the green house will sell before the non-green option,” said Fairchild.

Green Canopy solicits investors on a case-by-case basis, preferring private capital partners to traditional house financing. After sale, investors are paid back their initial investment and half of any profits. The company’s target is a 12 percent profit margin after subtracting acquisition costs, construction costs, and closing fees and commissions.

Scalability

The company has ambitious plans for expansion. All sales have thus far been in Seattle, but Green

Canopy aims to extend nationwide and will continue to pursue funding from the private equity market.

If the housing market rebounds, the market for acquisitions will constrict and force the company to explore alternative avenues to deal flow. Fairchild indicated that he is also considering a licensing or franchising model, or possibly moving into new construction, though this would always be a smaller percentage of their work. The company’s flexible approach to its business model is driven largely by the variability in the housing market.

ARRA

“ARRA helped our business model because it has raised our visibility with governments and private companies,” said Fairchild, even though the company did not receive any funding under the Recovery Act. Additionally, for some appliances such as ductless mini-split heat pumps, Green Canopy’s vendor received a utility rebate for each unit, resulting in lower costs to the company.

Policy Intersections

Fairchild suggested a Real Estate Excise Tax (REET) shift, in which investor and builders focused on energy efficiency would receive an incentive reduction in taxes. To make it revenue neutral, the reduction could be offset by a small increase in excise taxes among other homebuyers.

Additionally, the company likes the idea of mandated measures at the time of sale, which have been implemented in Berkeley and Vermont. Time-of-sale requirements could include standard energy-efficiency upgrades each time a house is put on the market. A less rigorous, and perhaps more politically viable, requirement would mandate an energy audit for each house on the market, with the energy performance score available to buyers.



Owner-Initiated Improvements Model

McKinstry

A full-service design, build, operate, and maintain firm, offering consulting, construction, energy, and facility services.

5005 Third Avenue South
Seattle, WA 98134

Number of Employees: 1600 Year Founded: 1960 Region Served: National www.mckinstry.com

Profile

McKinstry is a full-service design, build, operate, and maintain firm serving the commercial and institutional building sectors. The company addresses clients' varying energy needs over the life of a building. Founded in 1960 and now employing over 1600 employees and over \$400 million in annual revenue, McKinstry advocates sustainable solutions to improve system efficiency and reduce facility operational costs.

Business Model

Many projects at McKinstry begin with an energy audit to identify cost saving measures. These engineering-based audits include site investigation and interviews to discover potential areas of energy savings. Once any saving opportunities are identified and the project moves forward, the cost of the energy audit is absorbed into the cost of the project.

In its energy modeling work, McKinstry utilizes a Total Cost of Ownership (TCO) model throughout a project's development. After gathering energy consumption data, the firm makes project recommendations based on the client's needs and objectives. Rather than judging options only by up-front investment, the TCO model takes into account the energy savings captured over the life of an energy efficiency measure.

The McKinstry model helps clients access energy efficiency

improvements by coordinating the needed services and financing.

Service Coordination

By offering coordinated services, from initial energy audit to long-term maintenance of a building's energy systems, McKinstry provides access to energy efficiency products, proper installation, and operation. This model fully captures energy savings by ensuring that a building's potential for savings is realized through proper implementation and upkeep of the system.

Funding Coordination

An important part of McKinstry's model is assisting the client in navigating the complex funding arena for energy efficiency projects. McKinstry helps clients identify and apply for grants, then assists them in meeting reporting requirements. Funding coordination may also combine "utility rebates and incentives, government grants and tax



The Total Cost of Ownership model takes into account the energy savings captured over the life of an energy efficiency measure.

incentives, traditional financing sources, and innovative financial structures,” according to a company representative.

For example, McKinstry helped clients secure over \$45 million in ARRA grants, resulting in \$200 million in McKinstry projects. The influx of federal funding cast a positive light on the benefits of energy efficiency and demonstrated the potential of the industry to make a significant impact on the economy.

A further source of funding for McKinstry’s public-sector clients comes from utility incentives. Public facilities (schools, libraries, fire stations, and hospitals) can often receive up to 30 percent of project cost through utility rebates.

Funding Barriers

The greatest barrier to clients taking on energy efficiency projects is access to capital. While ARRA funding has catalyzed many projects, it is

unclear whether new sources of affordable funding will stimulate interest in energy upgrades in the future.

Future Workforce

Currently Washington’s K-12 and post-secondary education systems are not preparing enough students to pursue careers in science and technology, according to company representatives. To ensure that the next generation of workers has the requisite education and technical skills to execute energy projects, school curricula must emphasize science, technology, engineering, and math disciplines.

Policy Intersections

McKinstry identified state support for public infrastructure, especially around education and healthcare, as an important aspect of continuing energy efficiency projects. Support for public infrastructure could take the form of no-interest or low-interest financing and access to state capital for longer terms. To

ensure enduring energy efficiency in public infrastructure investments the state could, for example, require all state contractors to guarantee that their projects will perform to a certain level over time.



Third-Party Payment Model

Opportunity Council

A private, nonprofit human service organization with programs dedicated to weatherization and home repair and family and community services, among others.

1111 Cornwall Avenue Bellingham,
WA 98225

Number of Employees: 175 Year Founded: 1965
Weatherization 1979

Region Served: Island,
San Juan Whatcom Co

www.energysavvy.co

Profile

The Opportunity Council has weatherized homes for low-income residents of Island, San Juan, and Whatcom counties for over 30 years. In the early days, according to Executive Director Dave Finet, weatherization was prescriptive, and homes were generally treated with upgraded windows and doors but not tested for their performance. The Opportunity Council embraced diagnostic testing technology available in the early 1990s. The agency provides training in weatherization program implementation to other Community Action Agencies (CAA) in Washington and beyond.

Business Model

After confirming a client's income eligibility, the home is screened to determine whether it is a good candidate for weatherization. The home gets an energy audit, and the work is handled by a crew of two Opportunity Council employees, often in conjunction with contractors to do roofing, plumbing, or electrical work. Most jobs are completed in two to four days. The work is then inspected, and a final blower-door test is conducted to measure the "tightness" of the home.

This business model differs from other weatherization programs in that Opportunity Council uses its own crews to do the weatherization work. According to Finet, while all of the state's community action programs used to be crew-based, administration and personnel challenges led

many to switch to contractors. Finet said the in-house crew is still the right choice for the Opportunity Council's weatherization program in that it can standardize high-quality weatherization services and connect clients with other services in the organization.

The crew, for example, can connect the client to resources for home repair or detect and address a health risk in the home, such as mold or lead-based paint. Finet attributes the full integration of weatherization with other services to the success and quality of the program.

Efficiency Solutions

Besides the skills needed to weatherize a home, staff at Opportunity Council must be adept at juggling a variety of funding sources to complete a job. The Weatherization Program assigns four to 11 different



“Weatherization creates jobs, reduces energy consumption, and keeps people in their homes.”

—Dave Finet

funding sources to each home. Projects are regularly funded by Puget Sound Energy, Bonneville Power Administration, Orcas Power and Light, the Department of Energy, the U.S. Department of Health and Human Services Energy Assistance Program, and the Energy Matchmaker program through the Washington State Department of Commerce.

The crews doing the work are insulated from the funding puzzle in order to focus on quality of work, said Finet, but “the program managers have to be very savvy about how to weave all these funding sources together.”

Service Availability

One reason for using internal crews to do weatherization was the dearth of contractors qualified to do the work in the service area. With a Community Energy Challenge grant through

the Recovery Act, the Opportunity Council was able to focus on training the contractor base to do energy efficiency work.

Due to the ebb and flow of funding for weatherization, if the Opportunity Council finds it cannot retain its current crews, contractors are available to do the work. Finet said the above-mentioned training has created a contractor base to do weatherization for agency clients and bolstered access to energy efficiency services for the whole community.

Funding Challenges

As ARRA funding for weatherization comes to an end, Finet expected that the program will weatherize about one half as many homes in 2012 as in 2010. Funding from other government programs and especially from utilities will keep the program afloat, albeit on a smaller scale.

In addition, grant funding specific to administration has been reduced over recent years. The Opportunity Council is looking to the private sector for funding help for administrative expenses.

Policy Intersections

Finet expressed enthusiasm for the State’s Energy Matchmaker Program because it is flexible enough to use the funds for needed basic repairs coupled with weatherization. Funding for home repair generally is hard to come by, according to Finet, even though it requires a fraction of the cost of a new housing unit.

“I am optimistic that Washington will continue to invest in weatherization,” Finet concluded. “There’s a clear benefit to the community: It creates jobs, reduces energy consumption, and keeps people in their homes. I think we have a really good product.”



Owner-Initiated Improvements Model

Rushing Company

Engineering and consulting firm specializing in sustainable design practices and LEED certification for new construction.

1725 Westlake Ave N, Suite 300
Seattle, WA 98109

Number of Employees: 33 Year Founded: 2006 Region Served: Western WA www.rushingco.com

Profile

As a mechanical engineering, electrical engineering, and sustainability consulting firm, the Rushing Company models the industry shift toward uniting energy efficiency and sustainable practices with engineering work in commercial buildings. Through projects that infuse buildings with energy saving techniques and technologies, clients save on energy costs and realize a decrease in energy consumption.

Energy projects

A small and growing part of the business is energy retro-commissioning projects, which save clients 12 to 15 percent of a building's energy costs. In a typical project, engineers study the commissioning of the building when its systems were initially configured, and then reset the system appropriately for its present occupancy.

According to co-founder Rae Anne Rushing, most buildings have gone many years without being reset even through multiple occupants.

During retro-commissioning the project team checks the amount of air moving through each room and adjusts air temperature set points. Thermostats and diffusers might need to be moved to more appropriate spaces. Rushing explained that often the fix is as simple as moving a thermostat that is too near the heat given off by a printer or fixing an outdoor

air damper that has been sticking for years.

"At one museum in Seattle, even with a well-educated building facility staff," said Rushing, "we were able to reduce their energy costs by 30 percent."

Considering the energy savings associated with retro-commissioning, requests for the service are relatively few. Rushing cites financing for upfront costs as the key barriers. Rebates offered through utilities, Puget Sound Energy and Seattle City Light, have encouraged some clients to sign on to energy retrofit projects. The economy, however, continues to be fragile and – even when a project has a payback period as short as two years – the client might decline because the upfront financing is too steep.

Two years ago, Rushing explained, it was almost impossible to sell an energy



“At one museum in Seattle, even with a well-educated building facility staff, we were able to reduce their energy costs by 30 percent.”

—Rae Anne Rushing

retrofit, but she sees that aspect of the business picking up as the economy stabilizes.

Mechanical Engineering

The Rushing Company made an intentional shift to integrate sustainability with engineering when it acquired the sustainability consulting firm Blackbird Consulting in 2008. The acquisition brought new expertise in reaching LEED certification and incorporating energy efficiency into every aspect of design.

The majority of Rushing’s business, approximately 75 percent in 2010, is in mechanical engineering projects. Some clients have the goal of obtaining LEED certification, and 100 of Rushing’s 500 projects to date are LEED certified. “We don’t push clients toward doing a LEED certified building,” said Rushing, “but we always incorporate sustainable design strategies.”

Many practices do not require a

higher cost. “The easy wins for the client are those measures that build in energy efficiency without breaking the bank but put money back in the bank,” said Rushing. Indoor air-quality measures, for example, and outside air monitoring stations bring efficiency to the space in a cost-effective way.

Affordable Efficiency

Rushing proved energy efficient buildings can be done on a budget in its own office space. The goal, according to Rushing, was to show that it is possible to obtain a high level of LEED certification for a low cost.

On “a shoestring budget” Rushing upgraded a 10,000-square-foot space in a 1912 building and achieved both LEED Platinum certification and a 38-percent reduction in the space’s energy use. Rushing hopes the office will be an example to its clients that incorporating energy efficiency and sustainability into a new or renewed space does not have to

be a more expensive choice.

Policy Intersections

The federal Department of Energy requires building owners to publish Energy Use Intensity (EUI) scores for any building over 50,000 square feet. Rushing joins those in the global architecture and building community in supporting the goal of reducing the EUI score by 60 percent in new buildings, developments and major renovations, as compared to the regional average for that building type.

However, EUIs can be easily skewed for a building that has any unusual element. A score from an energy audit would therefore be a better indicator of a building’s efficient use of energy, and requiring such a score could enhance awareness of the energy saving potential in a building.



Third-Party Payment Model

UCONS

Utility management and services company specializing in the multi-family and mobile home market.

10612 NE 46th Street, Kirkland, WA 98033

Number of Employees: 17 Year Founded: 1991

Region Served: Western WA www.ucons.com

Profile

UCONS, LLC, a private Kirkland-based company, contracted with Puget Sound Energy to weatherize manufactured homes under a project called the Manufactured Home Duct Sealing Initiative. The utility received \$1.5 million in ARRA funding from the Washington State University Extension Energy Program as part of WSU's Community-Wide Urban Residential and Commercial Energy Efficiency Pilot Program. The remaining funding, approximately 65 percent of the total program cost, was supplied by Puget Sound Energy.

Business Model

UCONS began 20 years ago as an energy services company, and has evolved to specialize in multi-family homes and manufactured housing. The company developed a program to install efficiency measures in apartment complexes and later shifted to manufactured housing. In the last 10 years, UCONS has increased the efficiency of roughly 90,000 mobile homes in Washington, Texas, and California.

According to Puget Sound Energy, three out of four manufactured homes have leaky heating and cooling systems, creating uncomfortable living environments, energy waste, and higher utility bills. Simple duct sealing can address up to 30 percent of the leakage.

The activities funded by the UCONS program are generally inexpensive – approximately \$500 per home. Because the scope is limited, staff reported that it is easy for a well-trained

crew to blanket a mobile home park within a few weeks.

After testing each home for air leakage, the program offers free duct sealing, water pipe wraps, air filter replacement, compact florescent light bulbs, and high-performance showerheads and faucet aerators. UCONS is weatherizing 500 homes a month and by fall of 2011 will have completed 7,000 homes. Staff estimates there are approximately 74,000 customers in mobile homes in the region, the majority of which could benefit from weatherization activities.

UCONS' goal is "to get 90 percent of the cost-effective savings and try to get to as many homes as possible," said Tom Eckhart, UCONS Chief Executive Officer.

ARRA

The Recovery Act allowed UCONS to have consistent work during the recent recession and retain 17 employees. However, working



There are approximately 74,000 customers living in mobile homes in the region, and the majority could benefit from weatherization activities.

within the prevailing wage guidelines under ARRA proved to be challenging.

Up to this time, part of a weatherization employee's standard duties included installing showerheads and aerators and wrapping water heater pipes with insulation. ARRA made it no longer cost effective to conduct these tasks, requiring program operators to hire plumbers and pipe fitters in addition to weatherization employees.

In addition, ARRA mandated a reporting system requiring workers to track their tasks in 15-minute increments and assign that task to one of four categories. This causes significant accounting challenges, but UCONS indicated it has been able to meet the requirements and successfully pass their audits.

Utility Trends

The consensus of those interviewed was that the utilities will drive a high degree of energy

efficiency activities in the post-ARRA era. Northwest utility companies have demonstrated their ongoing commitment to energy savings, according to Eckhart, and have "very aggressive conservation goals."

This view was backed up by Dennis Rominger, Program Manager for Energy Efficiency Services at Puget Sound Energy. Rominger predicted that weatherization activities, rebates, and other incentive programs will continue at current levels or increase in the coming years.

However, Puget Sound Energy is still evaluating how the Manufactured Home Duct Sealing program will continue past the end of 2011. Later this year the utility will issue a request for proposals from bidders for existing programs, which UCONS will apply for. Funding will depend in part on the results of market research that Puget Sound Energy is conducting about the degree of need in the 11-county region it serves.

Policy Intersections

According WSU's weatherization program manager, William Ranes, local pilot projects continue to report that governmental subsidies are a vital component to their sustainability.

In his experience, most consumers are not taking advantage of the low-interest loan programs that exist for energy efficiency measures. Therefore, rebate programs and government incentives will still be necessary to drive demand. Further, under the weatherization programs' current business model, subsidies support the outreach and marketing activities that create both consumer and business awareness.

Rominger indicated that Puget Sound Energy is examining how the UCONS model – aggregated savings through conducting a neighborhood sweep approach – could be expanded to other, single-family homes.



Owner-Initiated Improvements Model

MetFab Heating, Inc.

Mechanical contractor offering heating and air conditioning, service and repair in the residential sector.

13914 NE 28th Street, Vancouver, WA
98682

Number of Employees: 10 Year Founded: 1981

Region Served: Clark Co. www.metfabheating.com

Profile

As one of the largest mechanical contractors in Clark County, MetFab Heating, Inc. has long promoted new energy efficient technologies. The 30-year-old company is a leader in installation of ductless heat pumps in the region. Ductless heat pumps use 25- to 50-percent less energy than electric resistance and forced air systems. The promotion of ductless heat pumps has been a target of ARRA funding in the form of tax credits and rebates.

Business Model

MetFab offers free consultation to potential customers, an opportunity the company uses to educate homeowners on heating options and corresponding incentive programs.

While the company installs a variety of HVAC systems, a generous rebate offered through Clark Public Utilities and the Northwest Ductless Heat Pump Project and a federal tax credit led to increasing demand for heat pumps from October 2008 through 2010. Of the 1,700 ductless heat pumps installed in Clark County during the rebate period, around 500 systems, or 30 percent, were installed by MetFab.

According to Jerry Sutherland, a system designer for MetFab, ductless heat pump installations accounted for 70 to 80 percent of MetFab's business in 2009 and 2010. Many homes relying on

electric baseboard or wall heaters could likely benefit from an upgrade to a ductless heat pump, according to the Northwest Energy Efficiency Alliance. Besides lowering energy use, ductless heat pumps appeal to many customers because the systems offer both a heating and a cooling capacity.

MetFab uses its advertising to emphasize the timeframe for taking advantage of financial incentives and the potential to reduce customer heating costs by 30 to 50 percent.

Financial Incentive

MetFab attributes much of the jump in ductless heat pump installations to the help of two financial-incentive programs. First, the utility rebate of \$1,500 through the Northwest Ductless Heat Pump Project is a considerable offset to the typical \$4,000 to \$6,000 single-zone



“You can train the contractors to be the promoters of energy efficiency.”

—Jerry Sutherland

ductless system. The utility rebate is in effect through October 2011, at which point it may be readjusted.

In addition to the rebate, MetFab customers could take advantage of a federal tax credit of up to \$1,500 through 2010 (the tax credit was subsequently set at a maximum of \$300 after 2010).

While Sutherland expects requests for ductless heat pumps to drop as the financial incentives lessen, the surge of business in ductless heat pumps came at a critical time during the recent economic downturn.

Energy Assessment

While MetFab does not conduct full energy audits, it provides an informal assessment of the home's efficiency as it relates to a new heating system.

MetFab inspects the home's insulation and windows to calculate the size of the heat pump needed. Sutherland said

this assessment leads to conversations about weatherizing the home.

Because a smaller and cheaper system could be installed in a better-insulated home, customers have an incentive to follow up on MetFab's assessment. According to Sutherland, many customers weatherize their homes in order to install a less expensive DHP system.

Policy Intersections

In order to align contractors with the goals of energy efficiency, MetFab advocates involving qualified HVAC contractors early in the policy-making process.

The contractor, explained Sutherland, already has a good idea of how customers will respond to a new regulation or incentive program. In addition, Sutherland stressed that new regulations often require

contractors to invest in training and equipment, and implementation of new regulations is most successful when contractors receive incentives in the form of free training or discounted equipment.

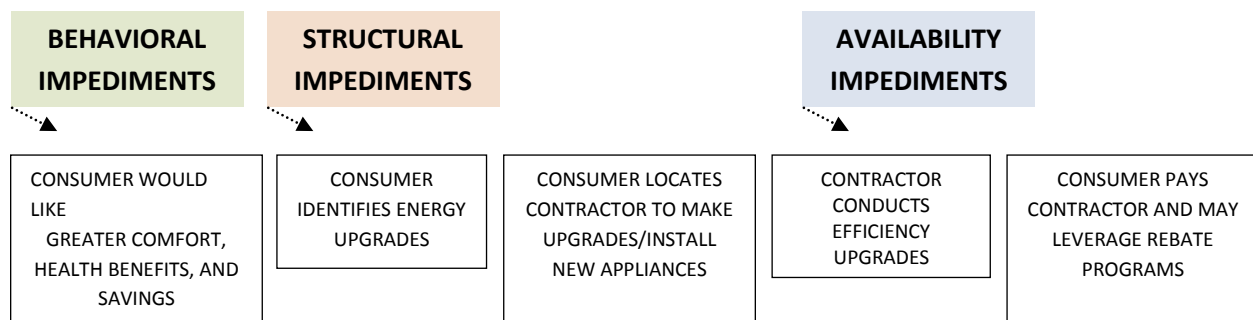
“You can train the contractors to be the promoters of energy efficiency,” said Sutherland.

ANALYSIS

The customers of the profiled companies can be separated into consumers (commercial and residential building owners), utilities, and the public sector. Projects can be driven by one or more of these market participants. The past two years have seen high investment from the public sector, but the future of the efficiency realm will depend to a greater degree on the consumer and utility sectors. This section examines the role of these two sectors in each company's business model, and the impediments each type of service will have to address in scaling its model.

McKinsey describes barriers to consumer adoption of energy efficiency upgrades as impediments of structural, behavioral, or availability (Figure 4). These barriers impact the consumer at various points along the process of purchasing upgrades.

Figure 4: Consumer Model and Impediments



Structural barriers include ownership transfer issues (the owner anticipates moving before upgrades pay off) and landlord/tenant situations in which the tenant pays for electricity but does not have authority to make upgrades. Another structural barrier is the “hidden cost” of an upgrade project, such as the time required arranging assessments and contractor visits, and the disruption imposed on occupants during construction.

Behavioral impediments include the risk and uncertainty regarding the ability to capture benefits of the investments, lack of awareness and information, and custom and habit. Consumers have little experience with efficiency projects and may overstate, in their own analysis, the risk that projected benefits will not be realized. Each company and program profiled in this report has adopted some form of consumer education measures, ranging from the “kitchen table” discussions employed by contractors at MetFab and UCONS to the online self-guided audit introduced by EnergySavvy.

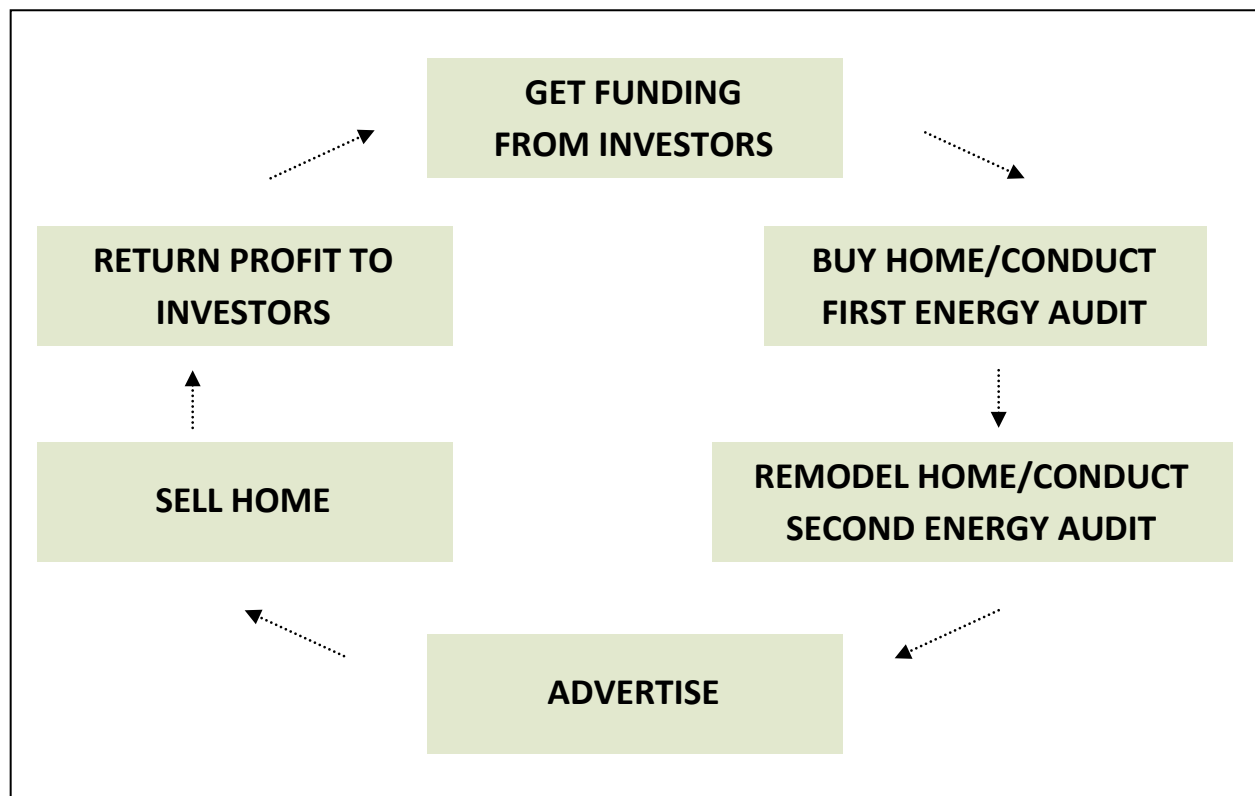
Availability limitations refer to the inability to finance upfront investments, insufficient equipment or skilled contractors to meet the demand, and improper installation and use of equipment. The obstacle of upfront costs is one that each firm faces, particularly those that do not receive federal dollars to offer incentives to their customers. To some degree, surmounting this barrier is dependent on Washington's emergence from the recession and the easing of the credit market for homeowners and small business owners. However, each service model has developed strategies to mitigate the upfront costs for its customer base.

Non-Owner Occupied Improvements Model

Green Canopy

Green Canopy's model removes the consumer from the decision-making chain, as the company makes a series of whole-home upgrades prior to sale (see Figure 5). Consumers might not invest in a retrofit of their own home or purchase a house requiring major renovations, but in making a purchasing decision they do consider the home's energy efficiency as an attractive feature and one indicator of quality. Green Canopy has therefore lowered the structural barrier by effectively doing an end-run around it.

Figure 5: Green Canopy's business model

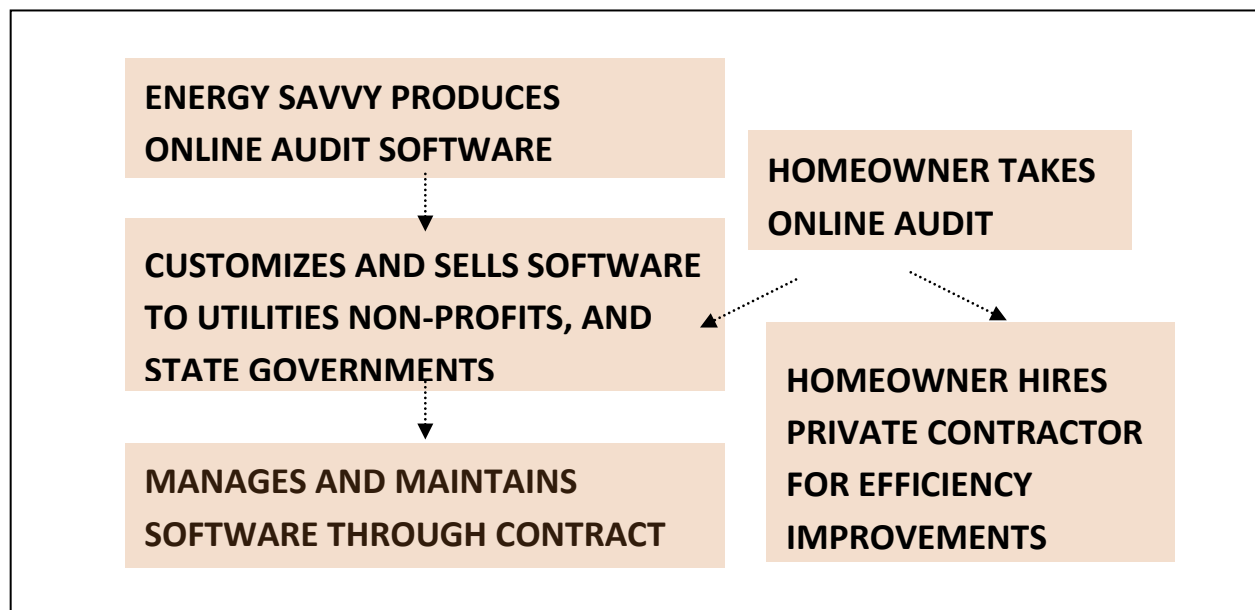


Information Model

EnergySavvy

EnergySavvy's online home audit software is increasingly used by utility agencies to encourage their consumer base to make incremental changes, which in some instances are incentivized through rebates or discounts. The company primarily addresses the behavioral barrier, by providing consumers with information and referrals to pursue efficiency measures (see Figure 6).

Figure 6: EnergySavvy business model



Third-Party Payment Model

UCONS and the Opportunity Council

UCONS and the Opportunity Council surmount the structural barriers by having a third party (i.e., the public sector) pay for the upgrades directly (see Figures 7 and 8).

National research indicates that weatherization measures to low-income homes, if adopted to scale, would provide a 74-percent return on investment, which is far higher than for other categories of homes.²¹ In addition, these upgrades result in greater proportional savings in ongoing utility bill expenses for low-income residents compared to middle-class homeowners. However, the low-income demographic is least able to meet the upfront costs or qualify for financing to be able to pay for the upgrades. The key challenge is that the low-income homeowner realizes the return from upgrades, but a different entity has to make the investment. However, since utilities have to manage strategic

²¹ Granade et al., "Unlocking Energy Efficiency."

conservation as a resource, the gap between the need and the ability to pay creates an opportunity for targeted policy.

Low-income weatherization programs were established by community action agencies, and funded by government programs and utilities, to meet this challenge. Today the question is: Can they be sustained without subsidies? The activities of outreach and marketing drive awareness and demand, and these activities are hard to fund through consumer revenue alone. Typically, it takes significant financial support from a utility, federal or state agency to make the investment attractive to consumers. Government and utility subsidies are in some instances used to pay for the costs of an energy audit.

Research indicates that most consumers are only willing to pay for one-third to one-half of the costs of an audit.²² Further, an audit is only valuable to the extent that it leads to the homeowner taking steps to address the identified inefficiency. Faced just with the audit results, most homeowners do not take the next step and contract for weatherization. Additional intervention is required to get the consumer to take action. However, if the intervention is provided by the same company that conducted the audit, the consumer may distrust the findings and suspect that they are being “over-sold” on energy improvements. Nevertheless, consumers need some intervention to guide them through the process. Otherwise, consumers can become stalled or get overwhelmed when faced with financing decisions or upgrade choices.

Most consumers are only willing to pay for one-third to one-half of the costs of an audit.

UCONS and the Opportunity Council provide both the audit and the improvements, and do so at no cost to the homeowner, removing the uncertainty factor and upfront costs. Both organizations leverage economies of scale by contracting to make upgrades on hundreds of homes. In addition, by providing training to contractors around the state, the Opportunity Council has worked to address the limitation on skilled workers that EnergySavvy found to be a stumbling block in the more rural counties.

²² Todd Currier, Washington State University Extension Energy Program, telephone conversation with author, 9 May 2011.

Figure 7: UCONS business model

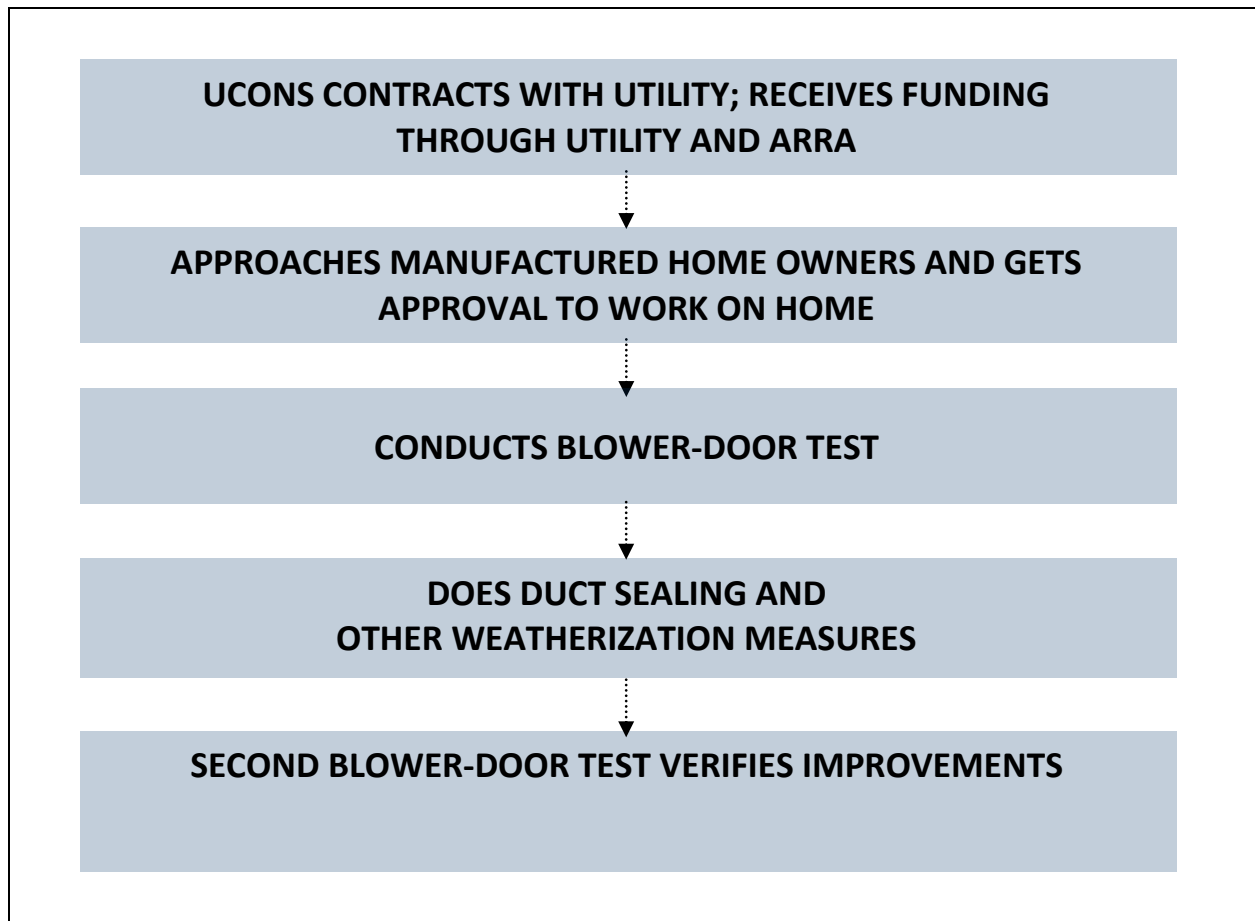
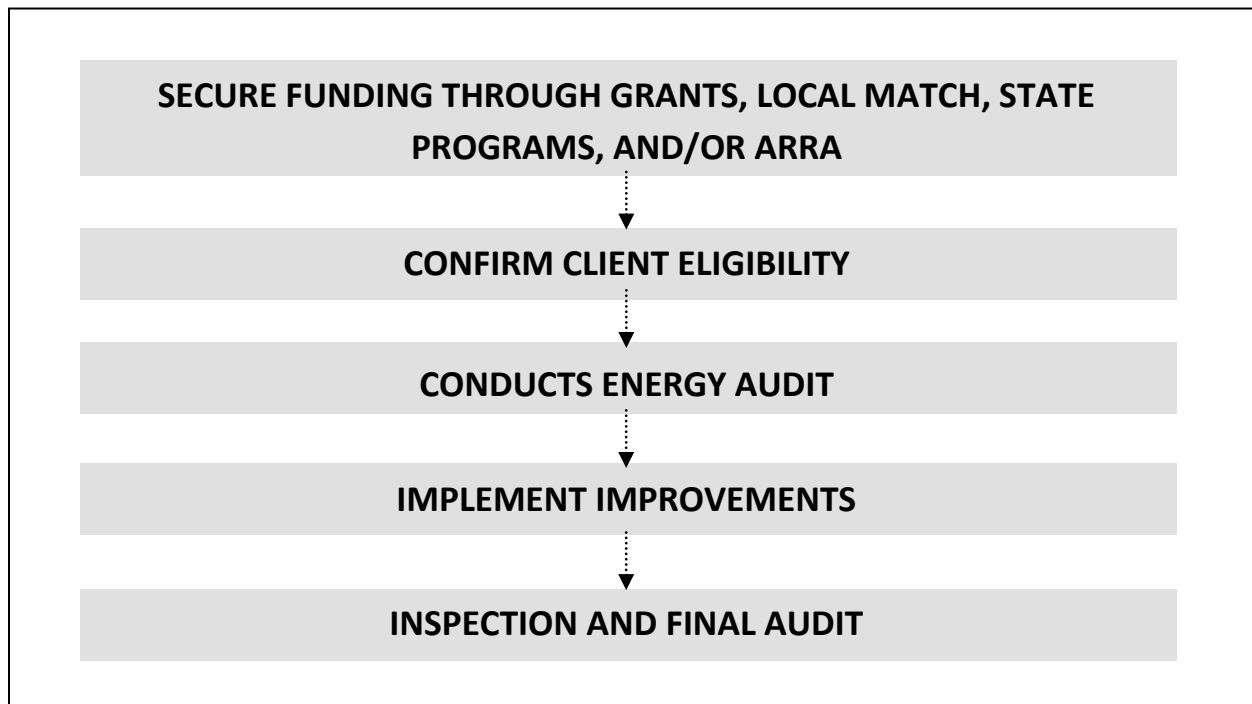


Figure 8: The Opportunity Council business model



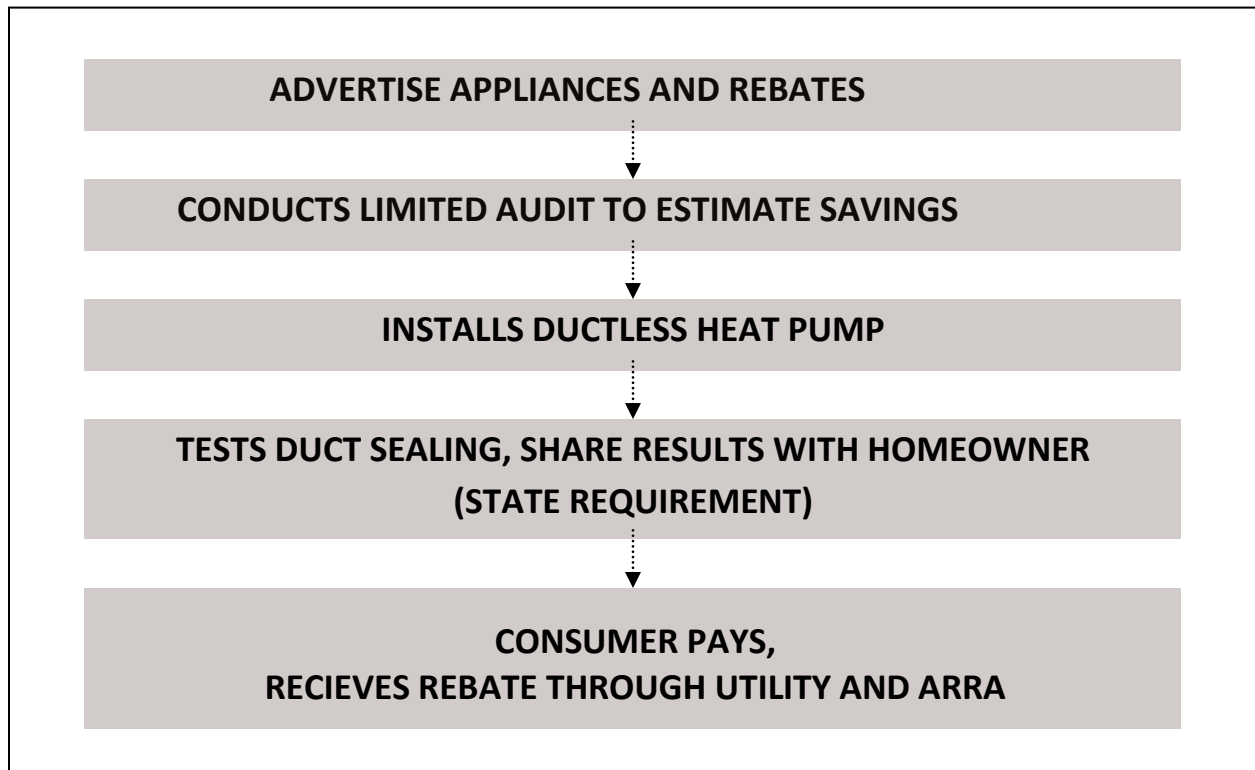
Owner-Initiated Improvements Model

MetFab, Rushing, and McKinstry

These three companies rely on consumer demand for energy efficiency products and services. Each has additional products and services not related to conservation. For instance, MetFab offers traditional heating and cooling systems, and Rushing provides architectural design which can be separated from efficiency-driven measures. These multifaceted approaches allow the companies to emphasize different services to different constituencies, and may help each firm weather economic downturns and shifting consumer needs (see Figure 9).

MetFab designed an advertising campaign around rebates for ductless heat pumps and was able to drive consumer awareness and demand in Clark County. In doing so, they focused on the limitation on availability identified by McKinsey. The company also addresses the structural impediment, by providing a free estimate of savings, and helping its customers access rebates. In doing so, MetFab has successfully made the upgrade to ductless heat pumps easy enough that thousands of customers in Clark County have made the decision to invest in one.

Figure 9: MetFab business model

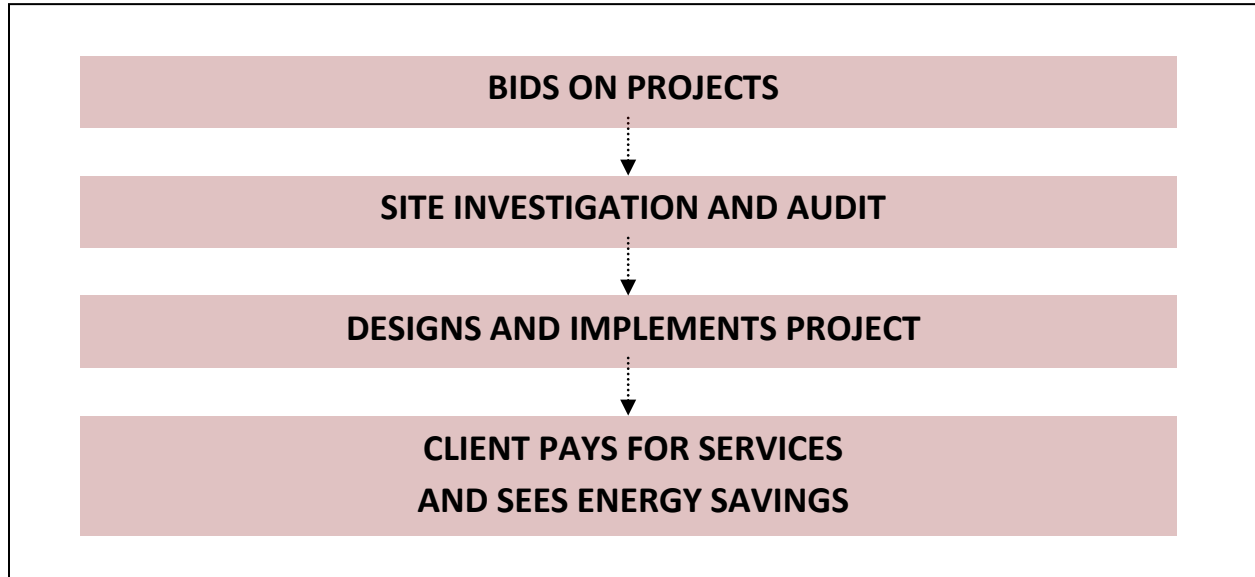


The Rushing Company and McKinstry

Rushing and McKinstry, serving the commercial market, share what is in many ways the most straightforward of the business models looked at in this study (see Figure 10). Both companies provide detailed audits, with estimates of savings to potential customers, and McKinstry guarantees those savings when customers purchase its maintenance plan. This approach addresses structural and behavioral barriers, and allows building owners to make fine-tuned calculations about payback period for their investment. Additionally, Rushing's retro-commissioning service mitigates the energy loss and added expense due to "custom and habit," identified by McKinsey as practices that prevent the capture of potential savings.

Both companies further attempt to address capital constraints, which are frequently an aspect of the availability impediment. Rushing has demonstrated that obtaining LEED Platinum certification can be achieved on a low budget, and works to package efficiency measures into all design projects in cost-effective ways. McKinstry connects clients to available grants and rebate programs, and provides grant management to some of its customers as well.

Figure 10: The Rushing and McKinstry business model





POLICY OPTIONS

The policy options suggested below are based on the results of interviews with company owners, program managers, utility company representatives, and those in the energy policy field. While not an exhaustive list, the policies highlighted are ones that can best help the emerging business models profiled in this report, and may inform the development of the Washington State Energy Strategy. The strategy, which will be submitted to the Legislature in December, 2011, is a comprehensive plan for meeting future energy needs that includes the goal of fostering a clean energy economy and jobs.

Disclosure Requirements

- The requirement for disclosure of energy usage prior to sale or lease for commercial buildings, established by the legislature in 2009, could be extended to the residential sector. Under this scenario, a homeowner would disclose typical energy consumption data or utility costs to prospective owners or tenants. Green Canopy's business model requires that home buyers perceive the additional value of a house with efficiency and other "built green" upgrades. Better disclosure of these characteristics in all properties – not just the ones with upgrades – would promote this business model by making it easier to realize the economic gains from a built green upgrade.
- A step further would mandate energy audits for each house on the market, and make the energy performance score available to buyers and renters. Audits could also be required for commercial and other real estate properties, and would complement the state's 2030 goal to reduce EUI scores by 60 percent. A voluntary version of this policy is being tested in Seattle and Bellingham under the Energy Performance Score pilot program.²³ Such a mandate would provide prospective homeowners with a concrete and uniform system for evaluating the energy performance of their homes.

Time-of-Sale or -Lease Upgrades

- Energy efficiency measures would be mandated at the time of sale or lease of real estate property, as has been implemented elsewhere in the country.²⁴ This requirement would allow buyers and lessees to include energy usage and lifecycle costs in their financial decisions.

²³ Washington State Department of Commerce, *Report to the Legislature, Home Energy Audit and Retrofit Including Home Energy Scoring*, (Olympia, January 2011), http://www.leg.wa.gov/documents/legislature/ReportsToTheLegislature/Home%20Energy%20Score%205854%20Sec%207%20Review%20Final_ed5aaddf-fa95-4639-b623-fb7be4da1a66.pdf. A voluntary version of this policy is being tested in Seattle and Bellingham under the Energy Performance Score pilot program.

²⁴ City of Berkeley, *Energy and Sustainable Development: Residential Energy Conservation Ordinance*, accessed on 14 July 2011, <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=16030>. Energy efficiency measures would be mandated at the time of sale or lease of real estate property, as has been implemented elsewhere in the country.

Efficiency measures could include installing a certain R-value of attic insulation, duct sealing, or even simply compact florescent bulbs. As an alternative to mandates, state tax breaks or utility rebates for sellers or landlords who make these efficiency investments would provide a financial incentive for sellers to undertake these improvements at time of sale.

Supporting and Working with Contractors

- Washington, in collaboration with the utilities, could continue to invest in training efforts for contractors. According to McKinsey, capturing the full potential of efficiency measures in the built environment will require a 30- to 40-fold increase in certified contractors.²⁵ Because the recession is significantly impacting the construction market, most contractors do not have the funds to invest in the training and appliances to leverage energy savings. By continuing to make these opportunities available, Washington can help contractors prepare for the economic recovery and learn the skills they will need as increasing numbers of consumers request efficiency upgrades. While training may not immediately lead to employment, the economic downturn has created an opportunity to invest in skills development for workers for the benefit of tomorrow's economy.
- Collaborate with home installation and upgrade contractors in developing requirements for future consumer incentive programs. The contractors are on the front line of the cultural shift to energy efficiency. They conduct audits, sell appliances and equipment, and are often responsible for ongoing maintenance and troubleshooting. These businesses are typically best placed to gauge the consumer response to proposed standards and regulations.
- We echo the recommendation from *2011 Biennial Energy Report with Indicators*, which proposes that the Department of Commerce “develop and implement a streamlined program of contractor certification and registration, training standards, periodic third party inspection of contractors’ work, and a complaint resolution system. Additional standardization such as standard contractor bid forms would clarify the work for consumers. The program will be designed to be compliant with the proposed, federal HomeStar program, or whichever national standard seems most likely to prevail at the time Washington’s program moves forward.”²⁶
- Increased efforts are needed to address the underground construction economy, in which some businesses subvert rules and requirements to save costs. In her executive order, *Improving the Way State Government Serves Small Business*, Gov. Christine Gregoire directed the Employment Security Department and the departments of Labor and Industries and Revenue to protect law-abiding businesses from unfair competition from the underground economy, and enlist help

²⁵ Granade et al., “Unlocking Energy Efficiency.”

²⁶ Washington State Department of Commerce, *Energy Strategy Update and 2011 Biennial Energy Report with Indicators: Issues and Analysis for the Washington State Legislature and Governor*, (Olympia, December 2010).

from the public and the business community.²⁷ A 2007 report estimates that as many as 20 percent of construction employers misclassify workers to avoid worker compensation and labor laws, among other reasons.²⁸

Targeted Statewide Incentives

- A statewide, standardized utility incentive program would help contractors and homeowners know a single set of rules for rebate programs and other incentives in every county. This approach has been adopted by Oregon Energy Trust. “Utilities are the obvious entity to aggregate demand and drive systemic clean energy adoption. They already have the customers; they are developing the ability to gather data about energy use through power meters; they already institute demand-side management.”²⁹

Conclusion

To support a healthy economy for the state, the Department of Commerce strives to understand how government action and policy shape the state’s business climate. These policy recommendations suggest ways to support the ongoing drive toward energy efficiency and greater employment in the built environment, particularly as the funding made possible by the Recovery Act draws to a close. It will be important to sustain momentum in deep energy efficiency gains as the state, and its construction industry in particular, struggles to recover from the recent recession. Continuing activity in residential and commercial energy efficiency will not only benefit the state’s economy by employing a skilled and ready workforce, but it will provide access to significant savings made possible by conserving our electric resources. Conservation, in turn, allows us to meet the energy needs of our growing population without needing additional costly power generating plants.

Thus, supporting investment in economic activity in energy efficiency can be thought of as a “win-win-win,” serving the triple goals of greater employment for our workforce; savings for homeowners, tenants, and business owners; and easing the strain on our natural environment.

²⁷ Christine O. Gregoire, governor of Washington, *Executive Order 10-05, Improving the Way State Government Serves Small Business*, (Seattle, 26 October 2010).

²⁸ Jim Mayfield, *Presented to the Joint Task Force on the Underground Construction Economy, The Underground Construction Economy in Washington State: A Review of the Literature and Preliminary Findings*, Washington State Institute for Public Policy, (26 September 2007).

²⁹ Jules Bailey, “Energizing Cities: New Models for Driving Clean Energy Investment,” *New Energy Cities*, Climate Solutions (May 2010).